WebServices:

- WebServices are the Custom Business Logic Classes, Which can be accessible from the Third Party Applications.
- (Ex: From Banking Applications, Finance Applications, Insurance Applications, SAP Applications,...etc.)
- By using WebServices, we can expose the Business Logics, Data, and Functionalities to the Third party Applications.
- WebServices will make the Multiple Disparate Systems can communicate with other, in-order to exchange the data / business logic / functionalities.
- WebServices are Purely Platform Independent and Language Independent.

We have the below 2 types of WebServices.

1. REST Based WebServices (RestFul)

2. SOAP Based WebServices.

REST Based WebServices:

REST --> Representational State Transfer.

REST is an Architectural Style, Which has been purely implemented based on the HTTP Protocol.

It is using the Old HTTP Protocol to exchange the data / functionalities / business logic between the disparate systems.

They are using the old HTTP Protocol, and added a set of enhancements on Top of HTTP Protocol to exchange the data between the multiple Third Party Applications.

In RestFul WebServices, each Business Logic/ Functionality / Data will be referred as a "Resource".

For Each resouse, we can provide the resource name. We can access each resource by using the "URI (Uniform Resource Identifier)".

Syntax: http://www.sample.com/<resourceName>;

Salesforce provides a resource name for each object as below. Which is also referred as "Object ID / Schema ID / Object Key Prefix".

Object Name Resource Name / Object ID

Account ---> 001

Contact ---> 003

Lead ---> 00Q

Campaign ---> 701

Case ---> 500

Solution ---> 501

We can access each object records as below..

Ex: https://ap16.salesforce.com/001 --> Account Records

https://ap16.salesforce.com/005 --> User Records

https://ap16.salesforce.com/801 --> Order records

To access the resources over the HTTP Protocol, we have to use the below HTTP Methods.

HTTP Protocol provides the below 5 Methods to bs used to interact with the Resources to perform the operations.

1. GET : Used to Get the Records from the resource

2. DELETE : Used to Remove the records from the Resource

3. POST : Used to insert the New Records into the Resource

4. PUT : Used to Update the Existing records in the resource

5. PATCH : Used to Perform the Upsert Operation on the records. (i.e. Update + Insert)

Note:

RESTFul WebService will expose the response in the form of either "JSON / XML / TEXT".

Most of the Mobile Applications, Cloud Applications, Web Applications are supporting the RestFul WebServices". Because RestFul WebService are very lightweight, easy to implement, and easy to parse.

By using Apex Programming, we can build our own RestFul WeSservice and can expose the WebService to the Third Party Systems.

To Prepare the RestFul WebServices, Apex provides the below Annotations.

1. @RestResource()
2. @HttpGet()
3. @HttpDelete()
4. @HttpPost()
5. @HttpPatch()
6. @HttpPut()

@RestResource():

This annotation is used to expose a Business Logic Class to the Third Party System. So that it can consume the WebService, to exchange the data.

Note:

Each WebService Class should be defined with the "Global" access specifier.

Each WebService Class should be identified by using a "Resource Name", which can be provided by using the "@RestResource()" annotation.

i.e. Each RestFul WebService class should be pre-fixed with "@RestResource()" annotation.

Syntax:

```
@RestResource(URLMapping='/<ResourceName>/*')
Global Class <ClassName>
{
    // Write the Business Logic..
}
```

Note: URLMapping parameter is used to specify the resource name, through which the

WebService class can be accessible.

Ex:

```
@RestResource(URLMapping='/AccountsService/*')
Global Class AccountsManager
{
    // Write the Business Logic..
}
```

Ex:

```
@RestResource(URLMapping='/CaseManagerService/*')
Global Class CaseHelper
{
    // Write the Business Logic..
```

}

Accessing the RestFul WebService: (EndPoint URL)

Each RestFul WebService can be accessible by the Third Party Systems with the help of "URI" as below..

Syntax:

https://<ServerNumber>.Salesforce.com/Services/Apexrest/<ResourceName>

Ex: https://ap16.salesforce.com/services/apexrest/AccountsService

https://ap16.salesforce.com/services/apexrest/CaseManagerService

@HttpGet() Method:

HTTPGet Method is used to get required resources / information / data from the Provider / Server.

This annotation can be applicable only on the Method Level.

Note: All the WebService Methods should be defined with "Static" keyword and should be defined with "Global" access specifier.

Syntax:

```
@HttpGet()
Global static <ReturnType> <MethodName>(<Parameters List>)
{
    // Write the Business Logic..
}
```

Note:

We can't define Two Methods inside the WebService Class with the Same Annotation. (i.e. We can't define Two Methods with the "HTTPGet()" annotation)

Ex:

```
@RestResource(URLMapping='/AccountsService/*')
Global Class AccountsHelper
{
    @HttpGet()
    Global static List<Account> GetAllAccounts()
    {
        // Write the Business Logic, to Get All Account Records..
    }
}
```

Accessing the WebService:

Ex: https://ap16.salesforce.com/services/apexrest/AccountsService

We can invoke the WebService from the below tools.

1. Workbench Tool.
2. Postman Tool
3. Through Apex Programming
4. By using Integration Tools (Ex: Mulesoft, Tibco, Webmethods,...etc)
5. By using Third Party Applications.

UseCase 1:

Create a RestFul WebService to get all the Account Records exist inside the object.

Service Class:

```
@RestResource(URLMapping='/AccountsService/*')

Global class AccountRecordsService {

   @HttpGet()

Global static List<Account> GetAllAccounts()    {

      List<Account> lstAccounts = [Select id, name, rating, annualrevenue, phone, fax,type, ownership, customerpriority__C, active__c from Account Order by name];

      return lstAccounts;

   }

}
```

EndPoint URL:

https://ap16.salesforce.com/services/apexrest/AccountsService

Method Name: GET

UseCase 2:

Create a RestFul WebService to expose all the Hiring Manager Records, which are associated with "Bangalore Location".

Service Class:

```
@RestResource(URLMapping='/HiringManagerService/*')

Global class HiringManagerRecordsService {

@HttpGet()

   Global static List<Hiring_Manager__C> GetBangaloreHRRecords()    {
```

```
    List<Hiring_Manager__C> lstHRRecords = [Select id, name,
location_name__C, email_id__C,       contact_number__C from
Hiring_Manager__C  Where location_name__C = 'Bangalore'];

    return lstHRRecords;

  }

}
```

EndPoint URL:

https://ap16.salesforce.com/services/apexrest/HiringManagerService

Method Name: GET

RestContext Class:

RestContext Class will provides a communication mechanism between the Consumer and the Provider.So, that Consumer can provide the input Parameters to the Provider. Then provider will collect the required data based on the input parameters and will send the response back to the Consumer.

It contains 2 inner classes as below.

1. RestRequest Class.
2. RestResponse Class.

RestRequest Class:

This Class is used to make a request to the RestFul WebService by passing the required input parameters.

Note:

It will store the Input Parameters in the form of "Key-Value" pair Collection. Where Key is the Parameter Name, and Value is the Parameter Value.

Property:

Params:

This Property Contains all the Input Parameters in the form of Key-Value pair collection.

WebService will collect the input value from the RestRequest and get the required matching Data based on the input values.

Syntax:

Map<String, String> <collectionName> = RestContext.request.Params;

RestResponse Class:

This Class is used to collect the response from the WebService.

UseCase 3:

Create a RestFul WebService to Get the Case Details based on the Supplied Case Number at runtime.

Class Code:

```
@RestResource(URLMapping='/CaseDetailsService/*')

Global class CaseManagerHelper {

 @HttpGet()

Global Static Case GetCaseRecordByNumber()  {

    Map<String, String> inputParams = RestContext.request.Params;

    Case caseRecord = [Select id, caseNumber, status, type, priority,
origin,Reason, Subject, Description from Case
      Where CaseNumber =: inputParams.Get('cNumber')];

    return caseRecord;

  }
```

```
}
```

Testing:

URL : /services/apexrest/CaseDetailsService/?cNumber=00001016

Method: GET

UseCase 4:

Create a RestFul WebService, to Get the All the Customers Information from the Object based on the specified "Industry Name" at runtime.

Class Code:

```
@RestResource(URLMapping='/SearchAccountsService/*')
Global class AccountsSearchHelper {
   @HttpGet()
Global static List<Account> GetAccountsByIndustry()    {
      Map<String,String> inputParams = RestContext.request.Params;
      List<Account> lstAccounts = [Select id, name, rating, industry, annualrevenue,
                        phone, fax, type, customerPriority__C, active__C
                                    from Account
                                    Where industry =: inputParams.Get('indName')];
          return lstAccounts;
   }
}
```

Testing Process:

URL: /services/apexrest/SearchAccountsService/?indName=Education

Method: GET

Assignments:

1. Create a RestFul WebService, to Fetch All the Cases based on the Specified

Priority.

2. Create a RestFul WebService, to fetch all the Hiring Managers based on the

specified Location Name.

3. Create a RestFul WebService, to fetch all the Lead Records, based on the

specified Status.

4. Create a RestFul WebService, to Fetch all the Opportunities based on the

Specified Account Name.

5. Create a RestFul WebService, to fetch all the Related Positions based on the

Specified Hiring Manager Name.

HttpDelete Method:

By using this method we can fetch the related records from the object based on the supplied input parameters and we can remove the records from the object. We can remove either one or more records from the object, by using this method.

Syntax:

@HttpDelete()

```
Global static <ReturnType> <MethodName>()
{
        // Write the Business Logic to remove the records from the object.
}
```

UseCase 5:

Create a RestFul WebService, to remove the Account Records from the object based on the supplied Account Name at runtime.

Class Code:

```
@RestResource(URLMapping='/SearchAccountsService/*')
Global class AccountsSearchHelper {
    @HttpDelete()
  Global Static string DeleteAccountsByName()  {
    Map<String, String> mapInputs = RestContext.request.Params;
     List<Account> lstAccounts = [Select id, name, rating, industry  from Account
                                                    Where name =: mapInputs.Get('accName')];
    if(! lstAccounts.isEmpty())  {
     Delete lstAccounts;
     return 'Records Deleted.';
   }
   else
     return 'No Matching Records Found.';
```

```
    }
}
```

Testing Process:

URL: /services/apexrest/SearchAccountsService/?accName=Sampath

Method : DELETE

Assignments:

1. Create a RestFul WebService, to Remove the Hiring Manager based on the Specified

Name.

2. Create a RestFul WebService, to Remove all the Related Cases from the Object

based on the specified Account Name.

3. Create a RestFul WebService to remove all the Related Contacts based on the

Account Name.

HTTPPost Method:

By using this Method, we can insert one or more records into the Objects. Upon invoking the request, we have to supply the required record details to the WebService in the form of "JSON Format".

We have to embed the request details inside the Request Body.

Syntax:

```
@HttpPost()
Global static <ReturnType> <MethodName>([Parameters])
```

```
{
        // Write the Business Logic..
}
```

UseCase 6:

Create a RestFul WebService, to Insert a Contact Record inside the Object. Supply the required Field values in the form of "JSON Format".

Service Class:

```
@RestResource(URLMapping='/ContactRecordsService/*')
Global class ContactRecordsHelper {
@HttpPost()
 Global static String CreateNewContact(string fName, string lName, string cTitle, string cEmail, string cPhone, string cFax, string cMobile, string cCity, string cState, string cCountry)    {
      Contact con = new Contact();
        con.FirstName = fName;
        con.LastName = lName;
        con.Title = cTitle;
        con.Email = cEmail;
        con.Phone = cPhone;
        con.Fax = cFax;
        con.MobilePhone = cMobile;
        con.MailingCity = cCity;
        con.MailingState = cState;
```

```
        con.MailingCountry = cCountry;
    insert con;
    if(con.Id != null)
    {
        return 'Contact Record Created with ID..: '+ con.Id;
    }
    else
        return 'Contact Record Creation has been Failed.';
        }
}
```

Testing Process:

URL: /services/apexrest/ContactRecordsService

Method: POST

Request Body:

```
{
        "fName":"Ram",
        "lName":"Kumar",
        "cEmail":"ramkumar@gmail.com",
        "cFax":"9900887788",
        "cPhone":"9900990000",
        "cMobile":"9988998899",
        "cTitle":"Product Manager",
```

```
                "cCity":"Hyderabad",
                "cState":"Telangana",
                "cCountry":"India"
            }
```

UseCase 7:

Create a RestFul WebService, to Insert a Hiring Manager Record inside the Object.

Service Class:

```
@RestResource(URLMapping='/HiringManagerRecordService/*')
Global class HiringManagerRecordsHelper {
@HttpPost()
   Global Static String CreateHRRecord(string hrName, string hrEmail, string hrPhone, string hrCity)    {
      Hiring_Manager__C hrRecord = new Hiring_Manager__C();
               hrRecord.Name = hrName;
        hrRecord.Email_ID__c = hrEmail;
        hrRecord.Contact_Number__c = hrPhone;
        hrRecord.Location_Name__c = hrCity;
      insert hrRecord;
       if(hrRecord.Id != null)
         return 'HR Record Inserted Successfully.';
      else
         return 'HR Record Insertion Failed.';
```

```
    }
}
```

Testing Process:

URL: /services/apexrest/HiringManagerRecordService

Method Name: POST

Request Body:

```
{
    "hrName":"Shubha Raghynadhan",
    "hrCity":"Bangalore",
    "hrEmail":"shubha@gmail.com",
    "hrPhone":"9900990000"
}
```

Assignments:

1. Create a RestFul WebService, to Insert a Lead Record inside the Object.

2. Create a RestFul WebService, to Insert an Opportunity Record inside the Object.

3. Create a RestFul WebService, to Insert a Position Record inside the Object.

UseCase 8:

Create a RestFul WebService, to Insert 2 Lead Records inside the Object.

Service Class:

```
@RestResource(URLMapping='/BulkLeadService/*')
```

```
Global class LeadRecordsHandler {

@HttpPost()

   Global static String CreateBulkLeadRecords()    {

      string leadRecordDetails = RestContext.request.requestbody.ToString();

      List<Lead> leadRecordsToInsert = (List<Lead>)
System.JSON.deserialize(leadRecordDetails, List<Lead>.Class);

      if(! leadRecordsToInsert.isEmpty())

      {

         insert leadRecordsToInsert;

          return 'Lead Records Inserted';

      }

      else

          return 'Lead Records Not Found. Invalid Data.';

   }

}
```

Testing Process:

URL : /services/apexrest/BulkLeadService

Method : POST

Request Body:

```
[

        {

                "FirstName":"Praveen",
```

```
        "LastName":"Kumar",
        "Title":"Sales Head",
        "LeadSource":"Web",
        "Rating":"Hot",
        "Industry":"Banking",
        "AnnualRevenue":4500000,
        "Phone":"9900889988",
        "Fax":"8899887766",
        "MobilePhone":"9900334433",
        "Company":"TCS Inc.",
        "Status":"Open - Not Contacted",
        "City":"Hyderabad",
        "State":"Telangana",
        "Country":"India"
    },
    {
        "FirstName":"Balaram",
        "LastName":"Kumar",
        "Title":"Project Manager",
        "LeadSource":"Web",
        "Rating":"Wrm",
        "Industry":"Technology",
```

```
                "AnnualRevenue":3700000,
                "Phone":"7788776655",
                "Fax":"9988997755",
                "MobilePhone":"8899665533",
                "Company":"IBM Inc.",
                "Status":"Open - Not Contacted",
                "City":"Bangalore",
                "State":"Karnataka",
                "Country":"India"
        }
    ]
```


@HTTPPUT Method:

By using this feature, we can update either one or more existing records inside the object by passing the values for the required fields.

Note:

Upon updating the records, we have to supply the "RecordID".

Note:

While Updating the records, we have to pass the required information to the WebService in the form of "JSON Format" through request body.

Syntax:

@HttpPut()

```
Global Static <ReturnType> <MethodName>(<Parameters>)
{
    // Write the Code to update the records.
}
```

UseCase 9:

Create a RestFul WebService, to Update the Case Record based on the Case Number, by assigning the values as below.

Case:Status = 'Working'

Case:Priority = 'High'

Case:Reason = 'Performance'

Service Class:

```
@RestResource(URLMapping='/CaseUpdateService/*')
Global class CaseRecordsHelper {
  @HttpPut
Global static String UpdateCaseRecord(string cNumber, string cStatus, string cReason, string cPriority)  {
    Case csRecord = [Select id, caseNumber, status, priority, Reason from Case
                                                    Where caseNumber =: cNumber];
    if(csRecord.Id != null)
    {
```

```
            csRecord.Status = cStatus;
            csRecord.Reason = cReason;
            csRecord.Priority = cPriority;
            Update csRecord;
            return 'Case Record Updated Successfully.';
        }
        else
            return 'Case Record Not Found. Invalid Case Number.';
    }
}
```

Testing Process:

URL : /services/apexrest/CaseUpdateService

Method: PUT

Request Body:

```
{
        "cNumber":"00001002",
        "cStatus":"Working",
        "cPriority":"High",
        "cReason":"Performance"
}
```

@HTTPPatch Method:

By using this method, we can perform the Update Operation and Insert Operation inside the object at a time.

Note:

While Performing the Patch Operation (i.e. UPSERT), we have to supply the records inside a Collection.

The Records which are having the record Id's those will get updated into the object. And the records which are not having the id's will get inserted as new records inside the object.

Syntax:

```
@HttpPatch
Global Static <ReturnType> <MethodName>(<Parameters>)
{
    // Write the Logic to Insert the Records.
    // Write the Logic to Update the records.
}
```

UseCase 10:

Create a RestFul WebService, to Update the Hiring Manager Records based on the specified Record ID. And Create a New Hiring Manager Record inside the Object.

Service Class:

```
@RestResource(URLMapping='/HiringManagerUpsertService/*')
Global class HiringManagerRecordsUtility {
@HttpPatch()
  Global Static string UpsertHRRecords(string recordID, string hrPhone, string hrCity)  {
```

```
        if(recordID != null && recordID != '')    {
        List<Hiring_Manager__C> lstHRRecords = new List<Hiring_Manager__C>();
         // Update the Hiring Manager Record...
        Hiring_Manager__C hrRecord = [Select id, name, location_name__C,
contact_number__C        from Hiring_Manager__C          Where id =: recordID];
        if(hrRecord.id != null)          {
           hrRecord.Location_Name__c = hrCity;
           hrRecord.Contact_Number__c = hrPhone;
          // Add the record to collection..
           lstHRRecords.Add(hrRecord);
        }
         // Create a New Hiring Manager Record..
        Hiring_Manager__C hr = new Hiring_Manager__C();
        hr.Name = 'Balaram Prasad';
                hr.Location_Name__c = 'Delhi';
                hr.Contact_Number__c = '9900887766';
                hr.Email_ID__c = 'balaram@gmail.com';
                 // Add the record to collection..
           lstHRRecords.Add(hr);
         if(! lstHRRecords.isEmpty())      {
           Upsert lstHRRecords;
           return 'Hiring Manager Records Upserted Successfully.';
```

```
        }
        else
            return 'Upsert Operation Failed.';
      }
      else
         return 'Please Provide the Record ID.';
   }
}
```

Testing Process:

URL : /services/apexrest/HiringManagerUpsertService

Method : PATCH

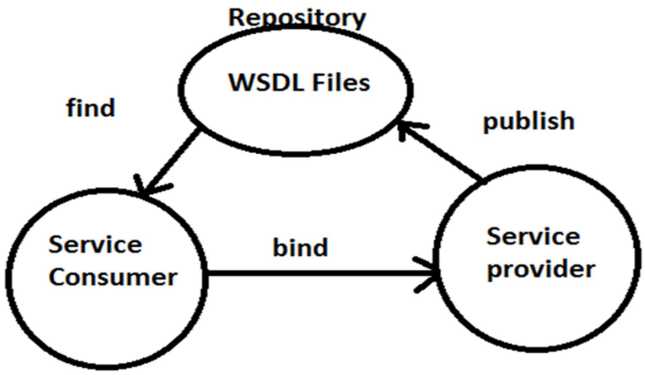
Request Body:

```
{
        "recordID":"a032w000008JfCf",
        "hrPhone":"6666000088",
        "hrCity":"Mumbai"
}
```

SOAP - API(Simple object access protocol)

SOA: Service Oriented Architecture

SOA Design Format:-



- It is abbreviated as protocol because it has its own processing roles and nameSpace.
- These client and web services are developed in different languages also. In this case data types and memory sizes of both languages will mismatch.
- So requests and responses are transferred in the form of soap messages.
- At client side ,a stub creates a soap request message with help of binding classes at client side . Similarly , a soap response message will be created by the soap process with the help of binding classes on the server side.
- A soap message contains two parts.
    1. Header
    2. body
- A soap message is called an envelope.
- Header part is optional and the body part is mandatory.

Soap Message

<soap:Envelope xmlns:soap=”http://Schemas.XmlSoap.org/soap/”>

<soap:Header>

_____

_____

</soap:Header>

<soap:Body>

_____

_____

</soap:Body>

</soap:Envelope>

- When a client calls a method of web service then a method call will be converted into xml and it will be inserted in a body part of the soap request message.
- One method call to another method call , xml will be different and I/P values are different in a soap body. So xml inserted in the soap body is called .
- According to the message exchanging format defined in the wsdl file.

  rpc/literal document/literal

  rpc/encoded document/encoded

- **Rpc style :** Method name used as root tag in xml under soap body.
- **Document style** : Message name used as root tag in xml under soap body.
- **Literal use:** only values are transferred in the xml file.
- **Encoded use:** only values with type are transfered.

rpc/literal:

```
<soap:body>
    <hello>
        <arg>ashok</arg>
    </hello>
</soap:body>
```

rpc/encoded:

```
<soap:body>
```

```
        <hello>
            <arg type=”xs:string”>ashok</arg>
        </hello>
    </soap:body>
```

document/literal:

```
    <soap:body>
        <xs:helloRequest
    xmlns:xs=”http://www.ias.com/Schema/types>
            <txt>ashok</txt>
        </xs:helloRequest>
    </soap:body>
```

document/encoded:

```
    <soap:body>
        <xs:helloRequest
    xmlns:xs=”http://www.ias.com/Schema/types>
            <txt type=”xs:string”>ashok</txt>
        </xs:helloRequest>
    </soap:body>
```

Soap Exception Handling

- When a client calls operations of web service, if any exception occurs in the operation of web service then directly that exception will not be thrown back to client application because client and server application may not be in the same language.
- If an exception occurred in web service then in binding classes at server side will convert that exception in <soap:fault> and fault message inserted in <soap:body> response and finally response will be sent back to client application.
- At client side the binding classes convert a <soap:fault> into an exception of the client side language and it will be thrown to the client application.
- <soap:body> message contains four parts.
    1. <fault code>
    2. <fault string>
    3. <fault actor>
    4. <details>

```
<soap:Envelope>
        <soap:body>
                <soap:fault>
                        <fault code>xxx</fault code>
                        <fault string>xxx</fault string>
                        <fault actor>xxx</fault actor>
                        <details>xxx</details>
                </soap:fault>
        </soap:body>
</soap:Envelope>
```

- The body part of soap response can have either return value of ws operation or **soap:fault** message.
- If ws operation is successfully executed then the body soap response contains return value. Otherwise it contains **soap:fault** messages.
- A **<fault code>** can be soap:client or soap:server or soap:version mismatch.
- If there is invalid i/p value sent by the client then **<fault code>** is soap:client. If an exception occurs in ws the <fault code> soap:server. If the version is mismatched the <fault code> is soap:version.
- **<fault string>** is readable message of exception then **<fault action>** is url of ws.
- **<detail>** contains exception object throws by ws in the form of xml.

WSDL(Webservice descriptive language)

SOAP-API also allows you to Salesforce provide two different SOAP API WSDLs (WSDL: Web service description language).

1. Enterprise WSDL
2. Partner WSDL

Enterprise WSDL(Web service description language)

- Enterprise WSDL is a strongly typed WSDL for customers
- It Changes if modifications are made to an Organization Salesforce Configuration.
- It is primarily for Customers.

Partner WSDL(Web service description language)

- Partner WSDL is a loosely typed WSDL for customers
- It is used for any Configuration of Salesforce
- Static and does not change if modification is made to an organization Salesforce Configuration
- It is Primarily for partners

About wsdl file

- Web Service can be developed in one language and its client can be developed in another language.
- In order to send information about webservice about methods in web service,i/p,o/p and location of a web service to the client , A WSDL file will be generated.
- Wsdl file contains five functions
    1. Types section
    2. Message section
    3. Port section
    4. Binding section
    5. Service section
- All the tag attributes that are required for construction of a wsdl file are given by WS-I organization under one nameSpace http://schema.XmlSoap.org/wsdl/.
- When constructing a wsdl file the above namespace will be imported into a WSDL file using xmlns keyword.

Types section

This section contains xml schema.

- In this optional eigher for I/P parameter or return types of methods
- If any equivalent complexType or simpleTypes are created under schema inserted in type section.
- Schema can be defined where as inline/outline means schema can be defined at outline of WSDL file.
- In the type section to define the schema, we need XmlSchema nameSpace to be imported.

- XmlSchema nameSpace imported with type section than the elements of this namespace can only be used under type section, not in wsdl file. In the wsdl file xmlSchema nameSpace will be imported under the root tag.
- In these elements,complexType and simpleType that are created will be stored in a target namespace.
- The elements of targetNamespace are required for the message section so targetNameSpace is also imported with a root tag with prefix “tns”.

```
<definitions xmlns=”http://schemas.XmlSoap.org/wsdl”
        xmlns=”http://www.w3.org/2001/XmlSchema”
        xmlns:tns=”http://www.ias.com/Schema/types”
        targerNameSpace=”http://www.ias.com/Schema/types”
    <types>
        <xs:Schema
targetNamespace=”http://www.ias.com/Schema/types”
            _____
            _____
        </xs:schema>
    </types>
</definitions>
```

Message section

- In this section two messages are created for each method of web service.
- A service provider will tell a client about how many parameters should be sent in a soap request message when calling a webservice method and what type of o/p will come in the soap response.
- A message contains one or more parts where each part indicates a parameter.
- A message section can have multiple messages and each identified with a name.

Example: class

```
Public interface Calculator{
Int add(int a, int b);
}
Public class Calculate implements Calculator{
    Public int add(int a, int b){
        return a+b;
```

```
            }
        }
```

Sample.wsdl

```
<definitions xmlns="http://schemas.XmlSoap.org/wsdl"
        xmlns="http://www.w3.org/2001/XmlSchema"
        xmlns:tns="http://www.ias.com/Schema/types"
        targerNameSpace="http://www.ias.com/Schema/types"
<message name="addRequest">
    <part name="a" type="xs:int">
    <part name="a" type="xs:int">
</message>
<message name="addResponse">
    <part name="a" type="xs:int">
</message>
</definitions>
```

Port type section

- This section talks about service endpoint interface and its methods.
- Port type name is the interface name and operation name is method name.
- If the interface has two methods then port type operation will be repeated for two times.
- Every operation contains I/p & O/p messages.
- When the wsdl file is given to us then 1st we need to refer to the port type section. Then next message section and then next to see schema & types section.

```
<portType name="Calculator">
    <operation name="add">
        <Input message="tns:addRequest">
        <Input message="tns:addResponse">
    </operation>
</portType>
```

Binding Section

This section following two information

- Which transfer protocol used for the communication

- Which message exchange format to be used for exchanging I/p & o/p of web service operation.

  Message exchange formats are in webservice

  - Style : rpc, document
  - Use : literal, encoded

1. rpc/literal
2. rpc/encoded
3. document/literal
4. document/encoded

```
<binding name=”calculatorBinding” type=”tns:calculator”>
<soap:binding transport=”http://schemas.XmlSoap.org/soap/http”
style=”rpc”/>
<operation name=”add”>
        <input>
                <soap:body use=”literal”>
        </input>
        <output>
                <soap:body use=”literal”>
        </output>
</operation>
</binding>
```

Service Section

- This section of the wsdl file tells about the address location of the web service in the network.
- It contains one or more ports and each port refers to a binding section.

```
<service name=”CalculatorService”>
        <port name=”calculatorPort” binding=”tns:calculatorBinding”>
        <soap:address location=”http://localhost:2022/calculator”/>
        </port>
</service>
```

Steps to download the WSDL:

- Click Setup
- Type API in Quick find/search
- Click API and Click Generate Partner WSDL
- Download WSDL

Step 1: Expose Webservice as a SOAP API.

```
global class FetchAccount1
{
webservice static Account createAccount(String Name) {
Account acct = new Account();
acct.Name = Name;
insert acct;
}
}
```

Above code insert account and will return the inserted account.

Considerations for Using the webservice Keyword

- We can't use the webservice keyword to define a class or an inner class method, interface, or to define an interface's methods and variables.
- We can use to define top-level methods and outer class method

Step 2: Generate Partner WSDL

- Click Setup
- Type API in Quick find/search
- Click API and Click Generate Partner WSDL
- Download WSDL
-

Step 3: Convert partner WSDL into Apex class

In the source Org Convert Partner WSDL into Apex Class

Steps:-

- Click setup and type apex classes in Quick search/find
- Click generate Apex from WSDL and select the saved partner WSDL

Let us see how to consume webservice through soap API.

```
string username =' '; //Target Org username
string password =' '; //Target Org Password
partnerSoapSforceCom.soap sp = new partnerSoapSforceCom.soap
();
partnerSoapSforceCom.LoginResult lg =
sp.login(username,password);
AccountCreateWIthSoap.AccWebService apexweb = new
AccountCreateWIthSoap.AccWebService();
AccountCreateWIthSoap.SessionHeader_element sessionHeader =
new AccountCreateWIthSoap.SessionHeader_element();
sessionHeader.sessionId = lg.sessionId;
apexweb.timeout_x =120000;
apexweb.sessionHeader =sessionHeader;
string response = apexweb.createAccount('Anuj');
system.debug(response);
```

The above code will create the account in the target Salesforce Org.

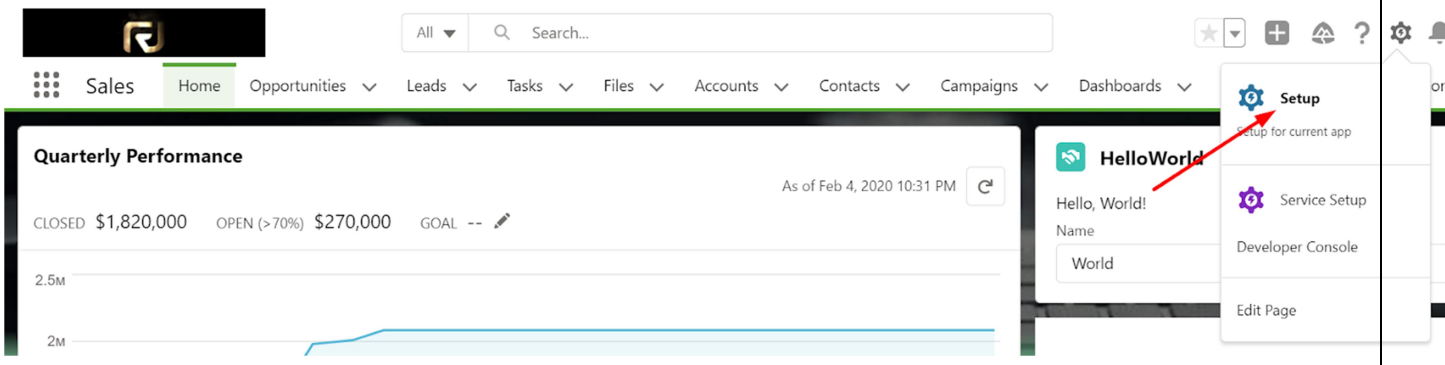
Step 1: Create a web service method on the server-side. Create a salesforce org instance using https://developer.salesforce.com, which will act as a server where will create a web service method to generate the leads.
To expose SOAP services:

- Create an Apex class.
- Add Webservice method.
- Complete your server logic.
- Exposed as WSDL.

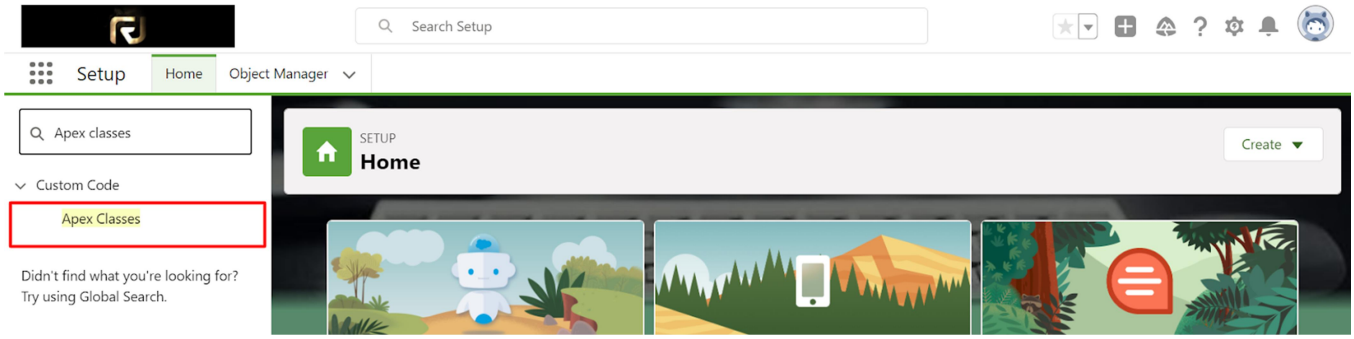
```
global class LeadManager {
    //add web service method in order to use SOAP API
    webservice static string createNewLead(String leadFirstName, String leadLastName, String leadCompanyName, String
        Lead LeadObject = new Lead();
        try{
            LeadObject.FirstName = leadFirstName;
            LeadObject.LastName = leadLastName;
            LeadObject.Company = leadCompanyName;
            LeadObject.Email = leadEmail;
            LeadObject.Phone = leadphone;
            INSERT LeadObject;
        }catch(Exception ex){
            System.debug('Exception is:::::'+ex.getLineNumber() +'  '+ ex.getMessage());
        }
        return LeadObject.Id;
    }

}
```

Step 2: Generate and share the WSDL with the client.

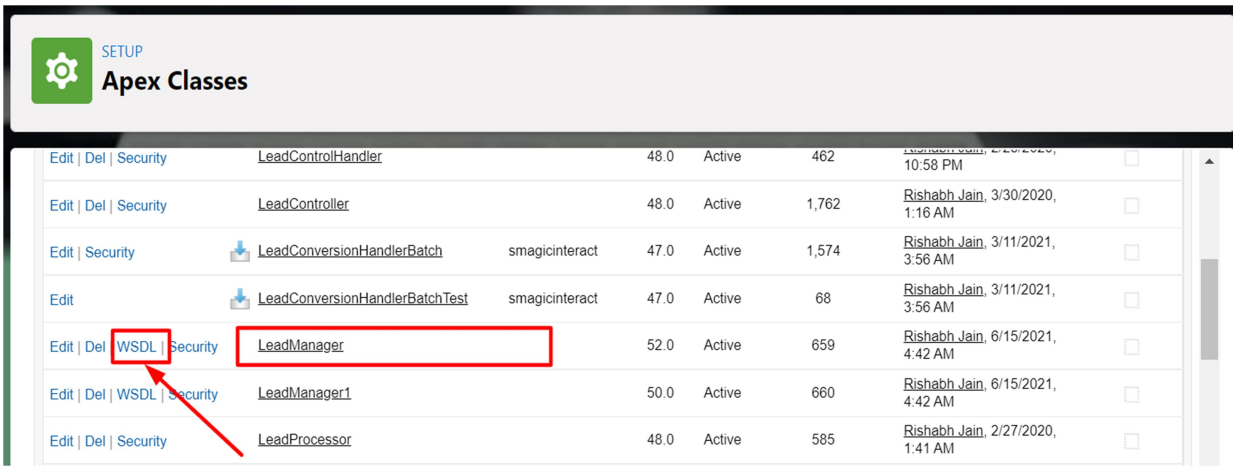
- Login to the salesforce -> Go to Home page -> Click on setup gear icon -> Click on setup menu.



- In the quick find box, search Apex classes.



- Search for the Apex class and click on the WSDL option to generate the WSDL file.



- Right-click on the page and save the file.

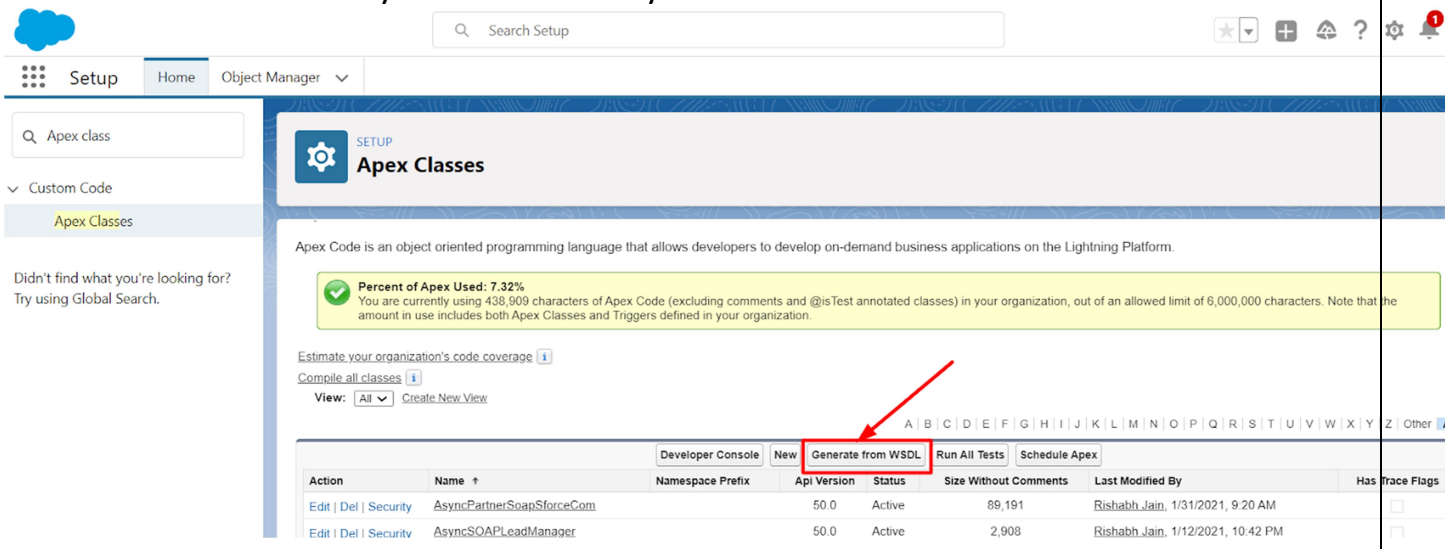
This XML file does not appear to have any style information associated with it. The document tree is shown below.

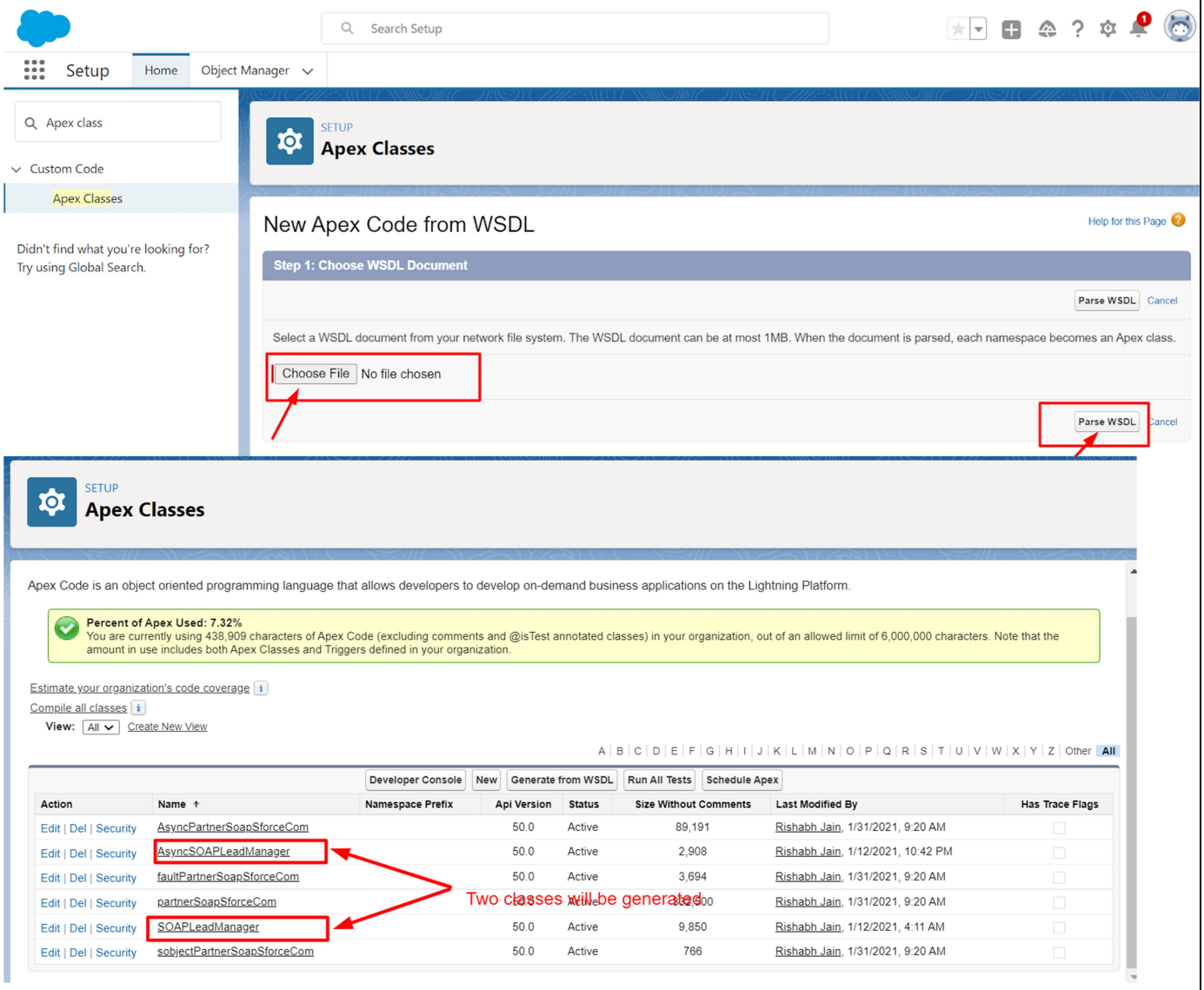
```
<!--
 Web Services API : LeadManager
 -->
▼<definitions xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns="http://schemas.xmlsoap.org/wsdl/" xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
 xmlns:tns="http://soap.sforce.com/schemas/class/LeadManager" targetNamespace="http://soap.sforce.com/schemas/class/LeadManager">
  ▼<types>
    ▼<xsd:schema elementFormDefault="qualified" targetNamespace="http://soap.sforce.com/schemas/class/LeadManager">
      ▼<xsd:element name="AllowFieldTruncationHeader">
        ▼<xsd:complexType>
          ▼<xsd:sequence>
              <xsd:element name="allowFieldTruncation" type="xsd:boolean"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      ▼<xsd:element name="CallOptions">
        ▼<xsd:complexType>
          ▼<xsd:sequence>
              <xsd:element name="client" type="xsd:string"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      ▼<xsd:element name="DebuggingHeader">
        ▼<xsd:complexType>
          ▼<xsd:sequence>
              <xsd:element name="categories" minOccurs="0" maxOccurs="unbounded" type="tns:LogInfo"/>
              <xsd:element name="debugLevel" type="tns:LogType"/>
            </xsd:sequence>
          </xsd:complexType>
        </xsd:element>
      ▼<xsd:complexType name="LogInfo">
        ▼<xsd:sequence>
            <xsd:element name="category" type="tns:LogCategory"/>
            <xsd:element name="level" type="tns:LogCategoryLevel"/>
          </xsd:sequence>
```

Right click on this file and save it.

Step 3: Client generates apex class from the WSDL.

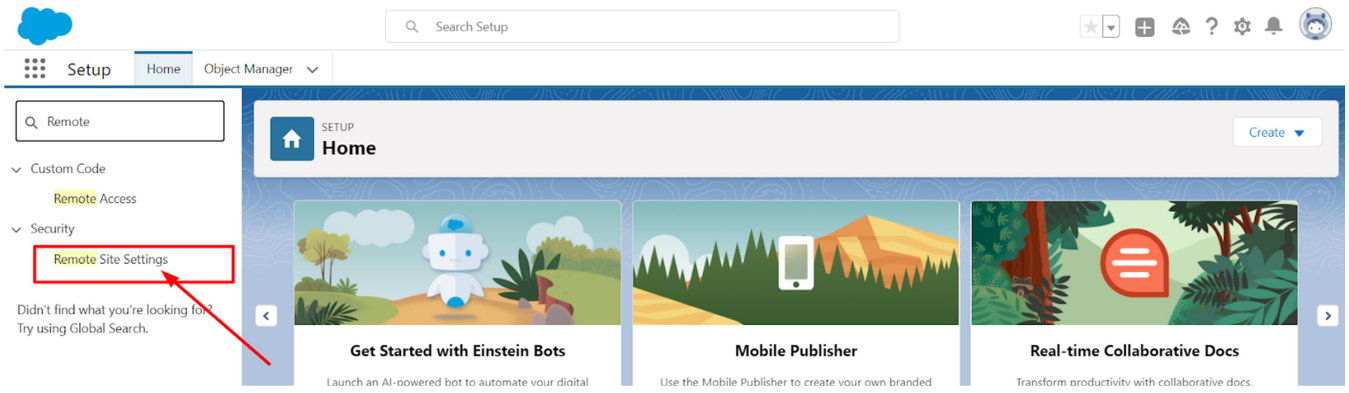
- Login to the client Salesforce org or sign up for the new Salesforce instance that will act as a client org using https://developer.salesforce.com/
- Go to the Home page -> Click on the Setup gear icon -> choose the setup menu.
- Search the Apex classes in the quick find box.
- Click on the button, i.e., Generate from WSDL.
- Choose the WSDL you saved recently.

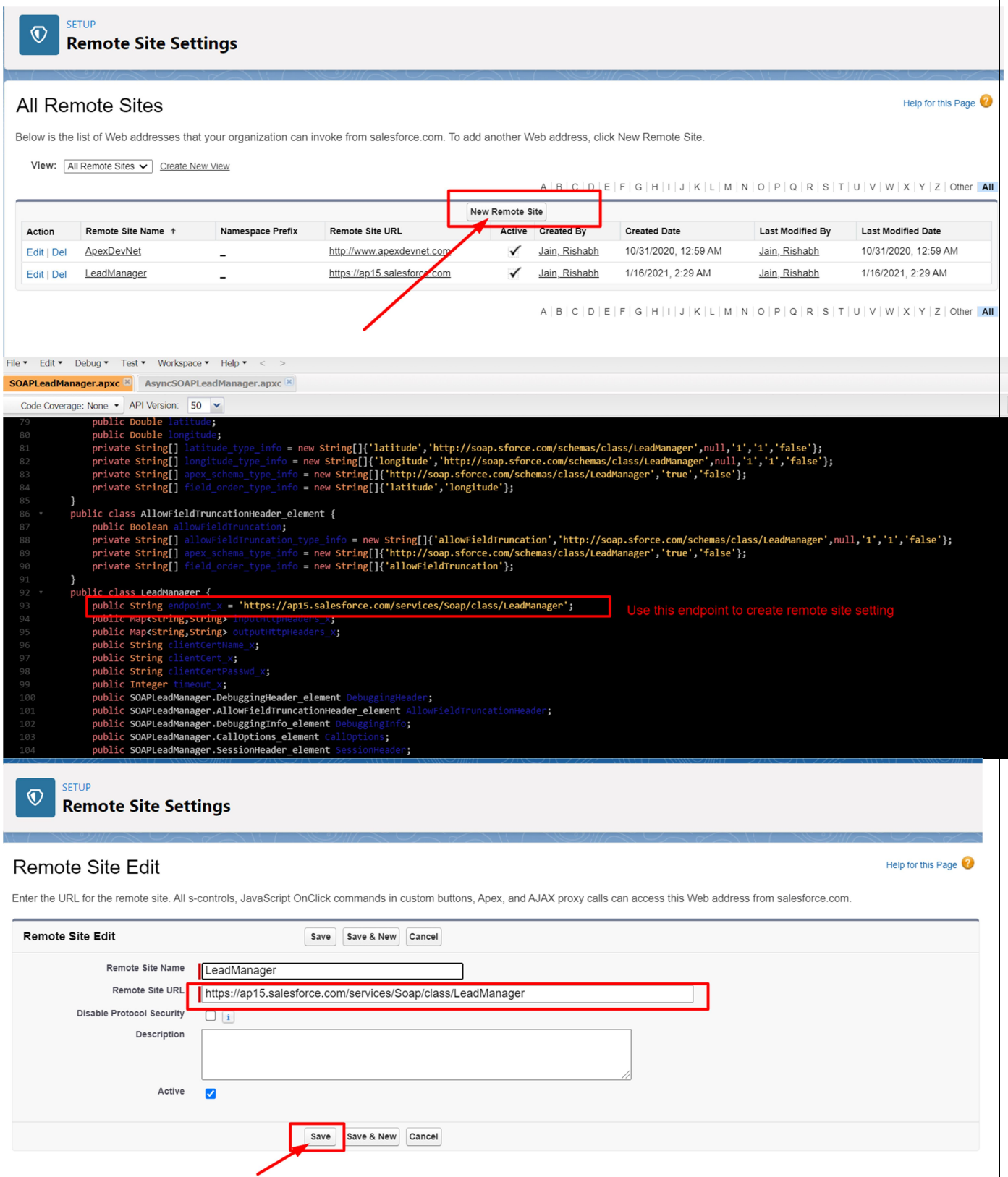




Step 4: Invoke SOAP call to the server.

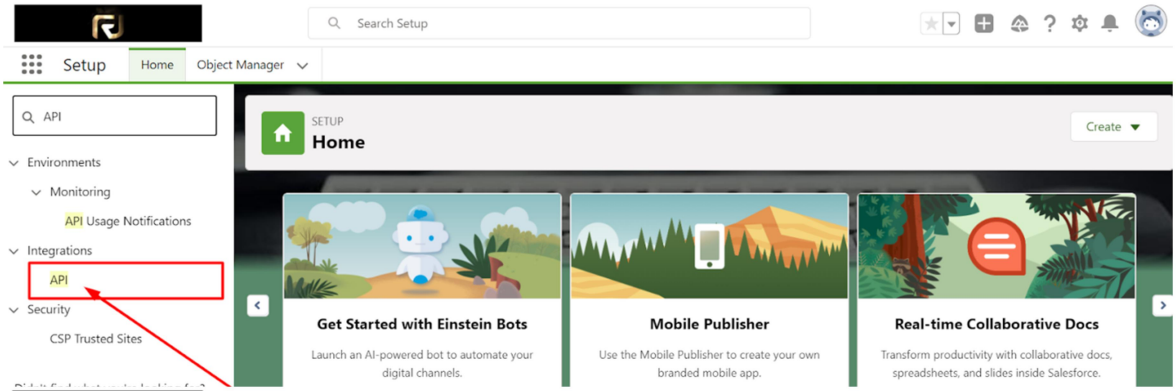
- Remote site setting.
    - Settings -> Remote Site Setting

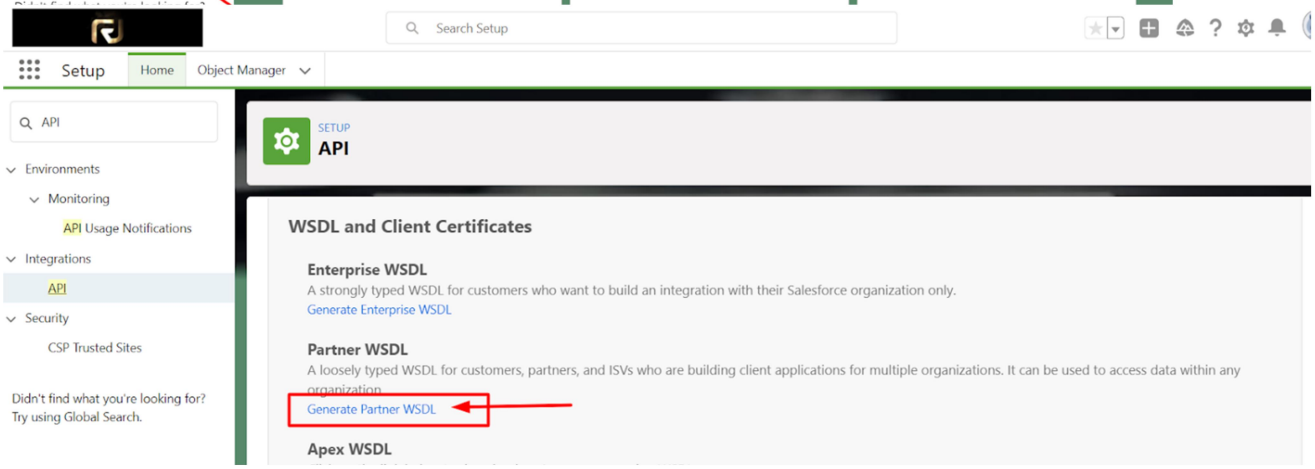


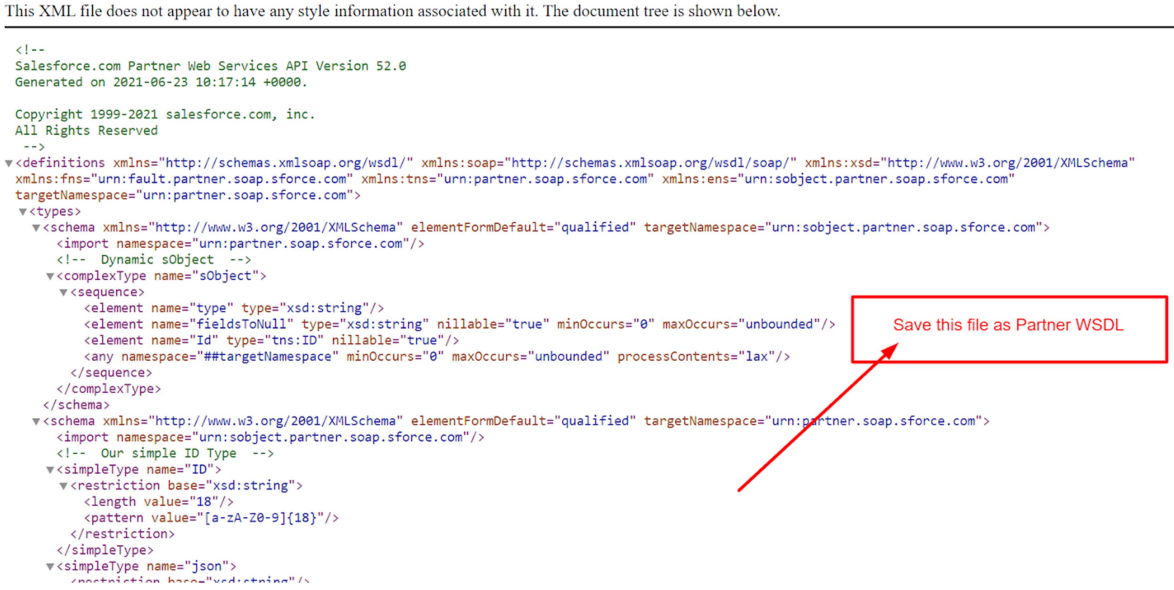


- Set Session – authentication parameter.

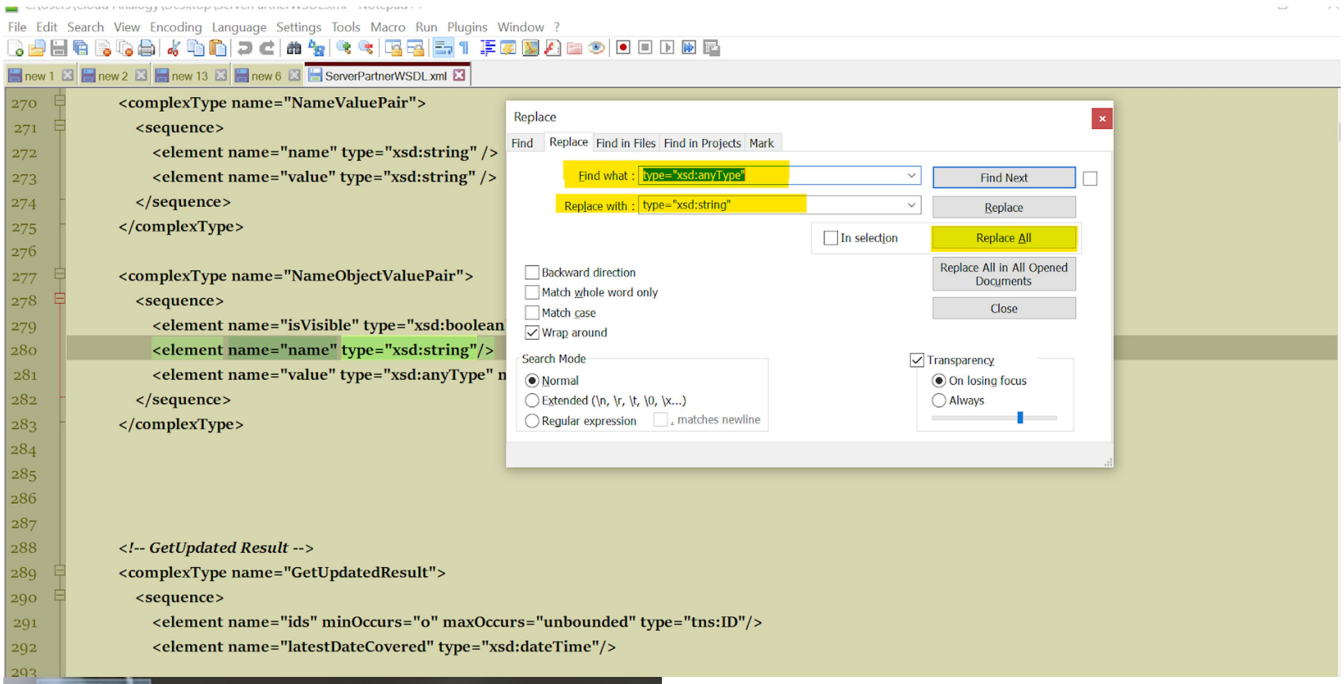
- Login to the Server-org.
- Setup -> Quick find -> API -> Choose WSDL file.

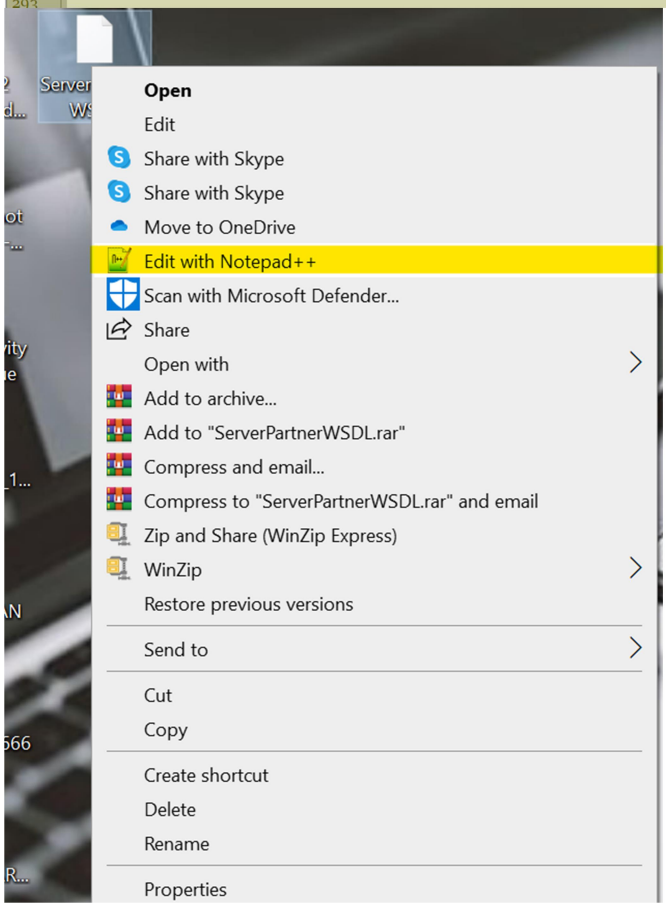






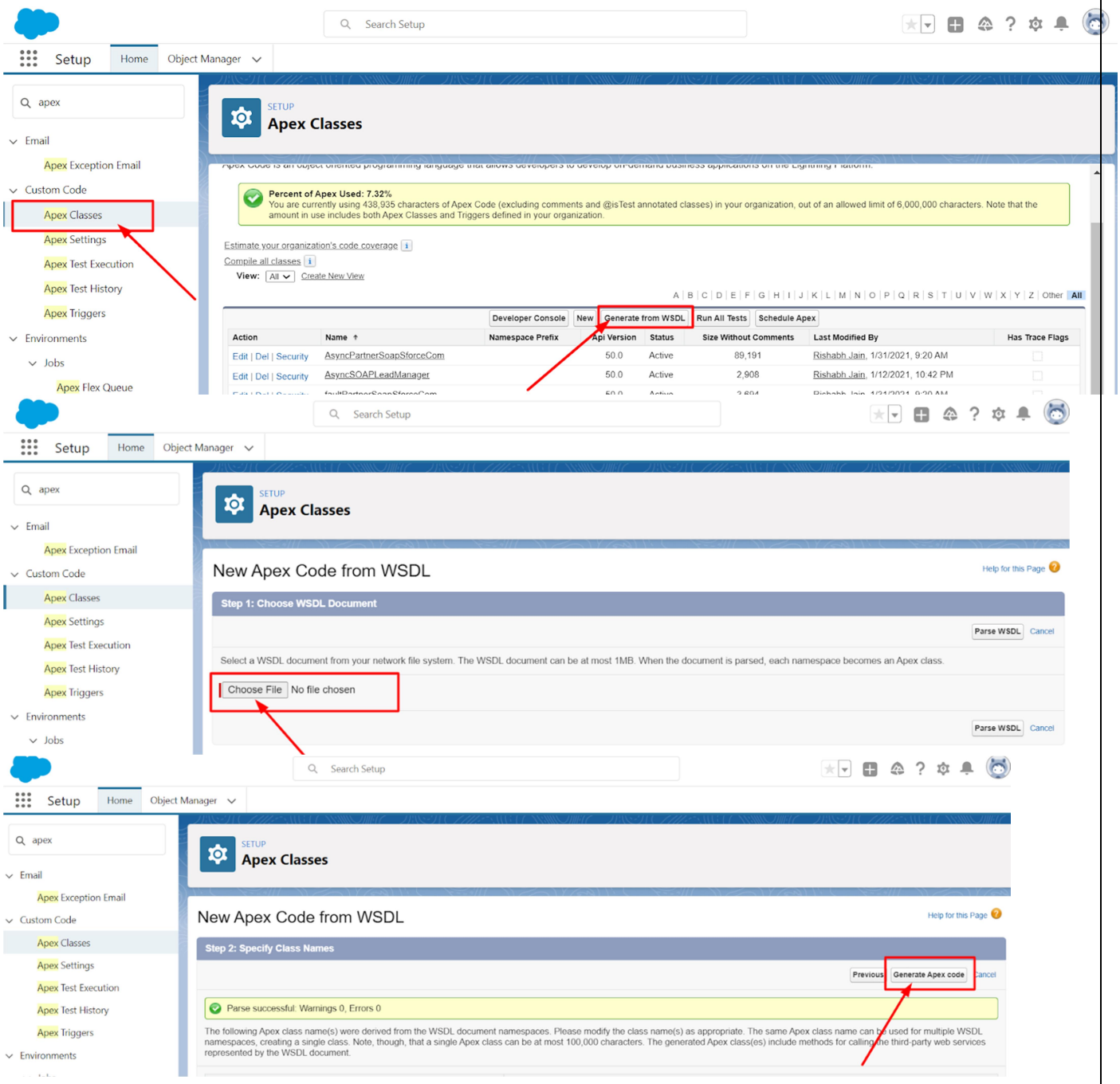
- Edit the above WSDL with the text editor.
- Find -> anyType and replace it with the string.

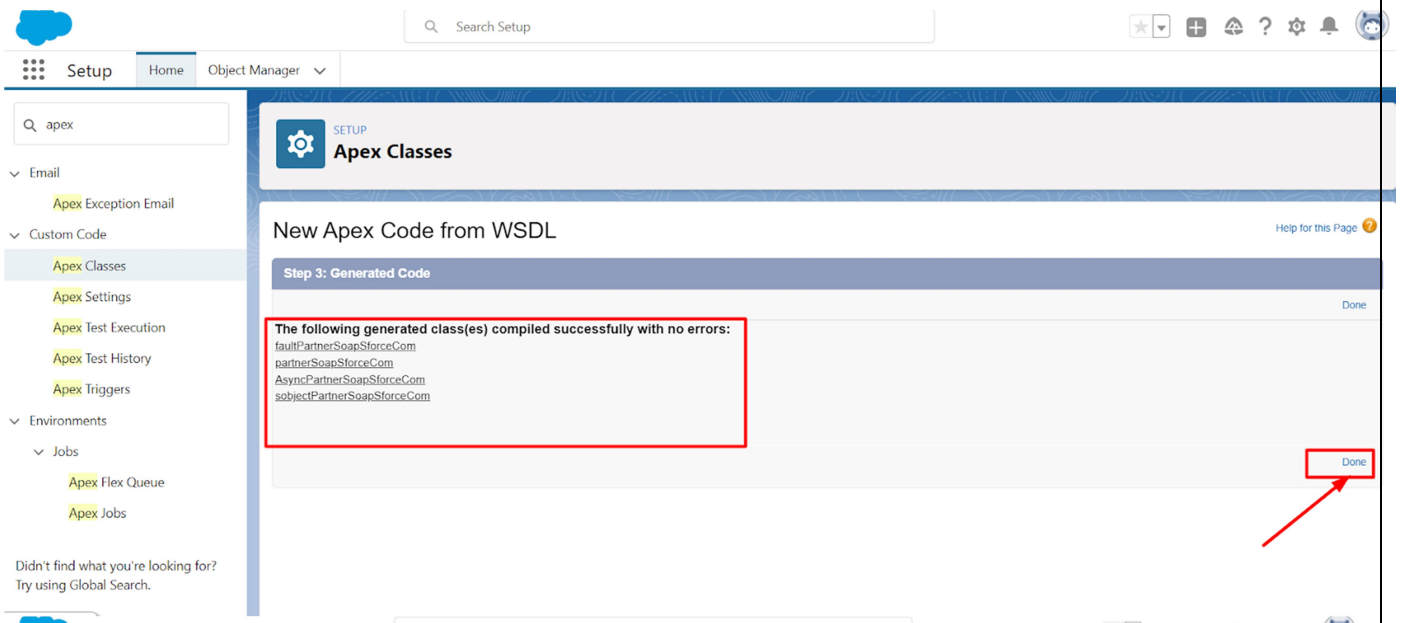


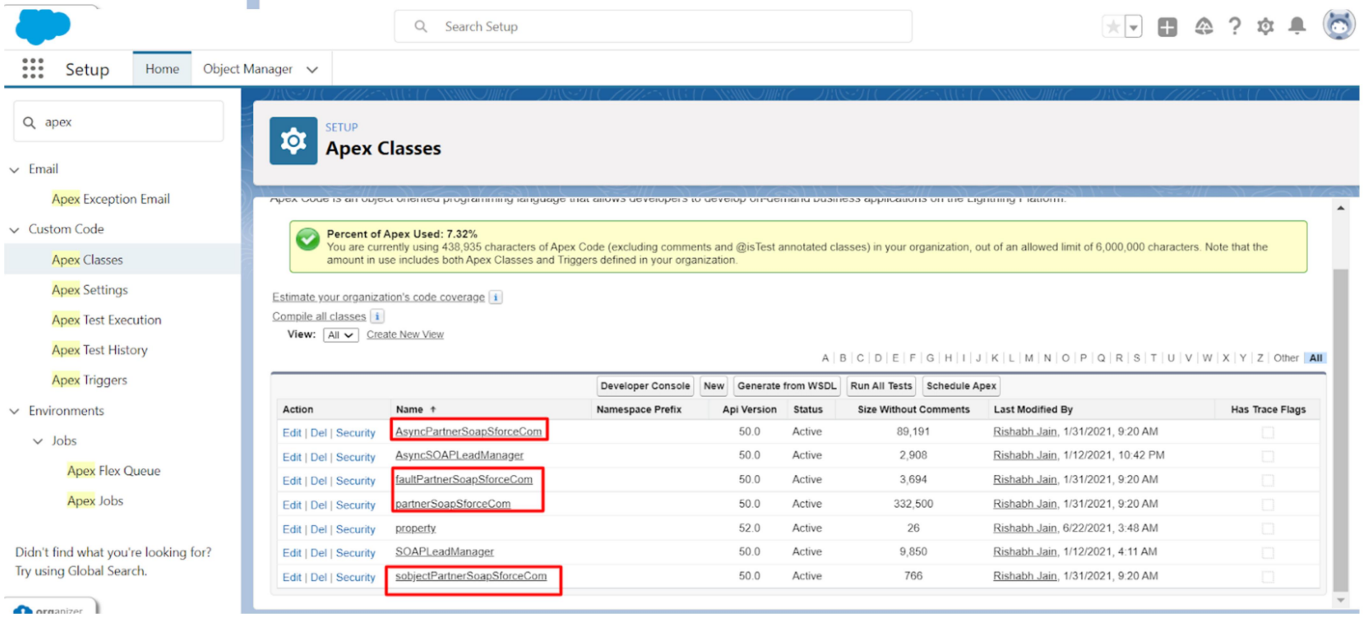


- Go back to the Client org.

- Generate the apex class from the WSDL file generated on the Server side.



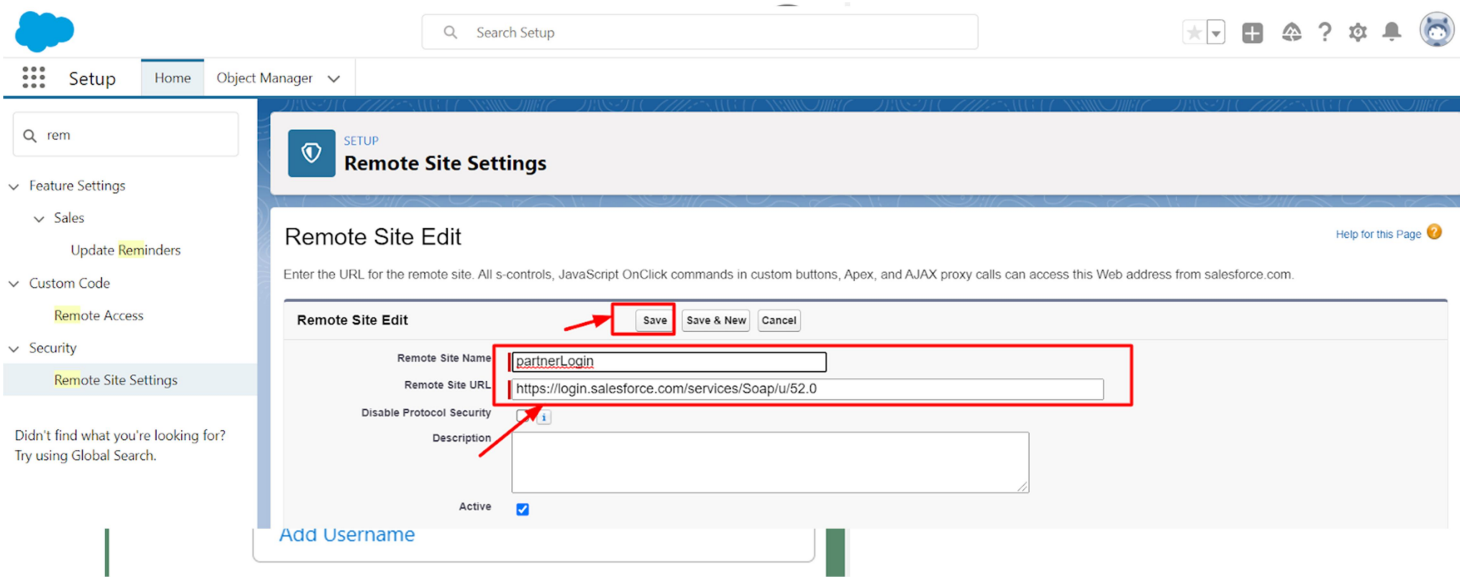




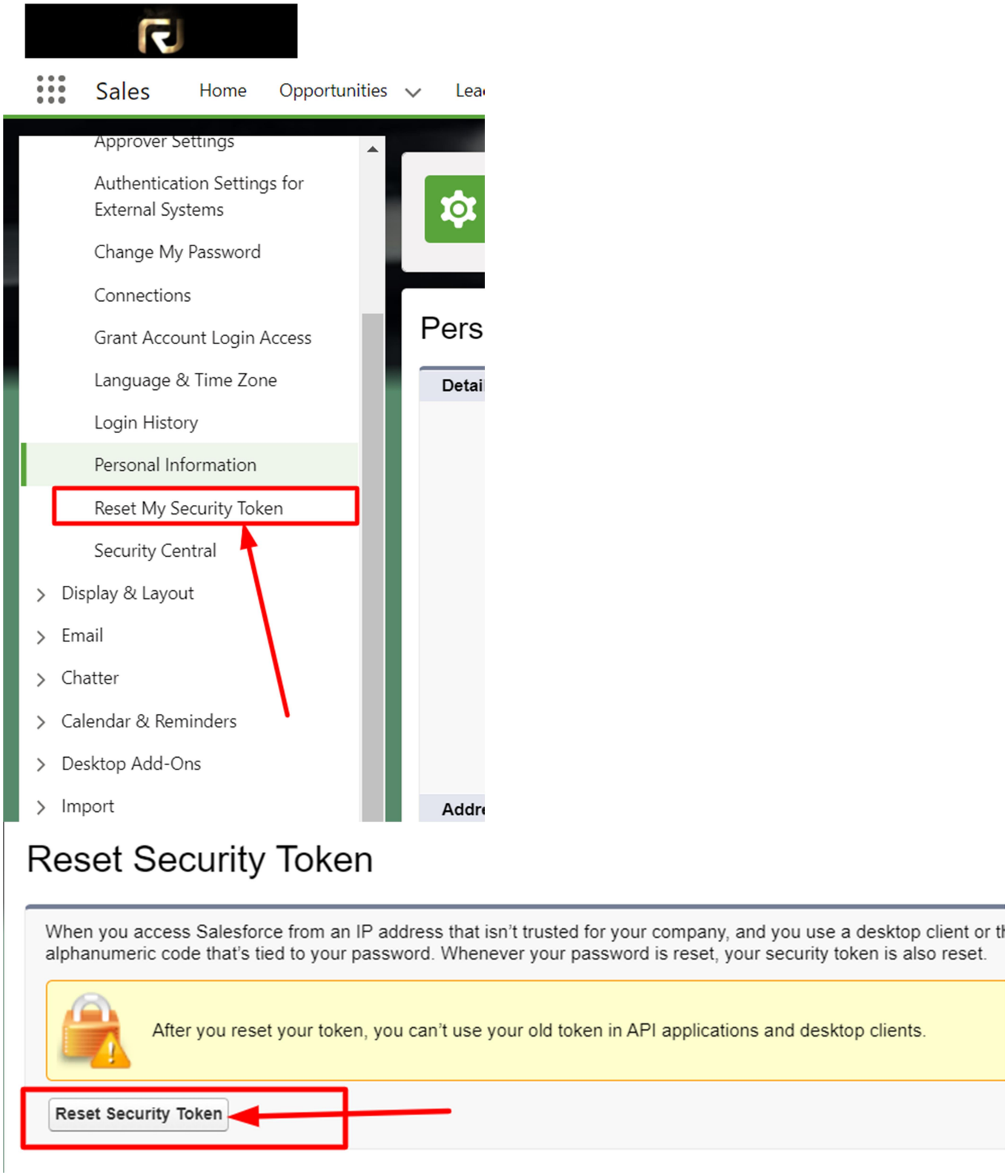
- Building Request Parameter.
  - Open the generated apex class i.e partnerSoapSforceCom.apxc in the client salesforce environment.
  - Create a Remote site setting for the below endpoint, which will be invoked for getting the session Id.

```
public class Soap {
    public String endpoint_x = 'https://login.salesforce.com/services/Soap/u/52.0';
    public Map<String,String> outputHttpHeaders_x;
    public String clientCertName_x;
    public String clientCert_x;
    public String clientCertPasswd_x;
    public Integer timeout_x;
```

- Go to settings.



- Click on Reset my security token.



- Go to your email account and get the security token.

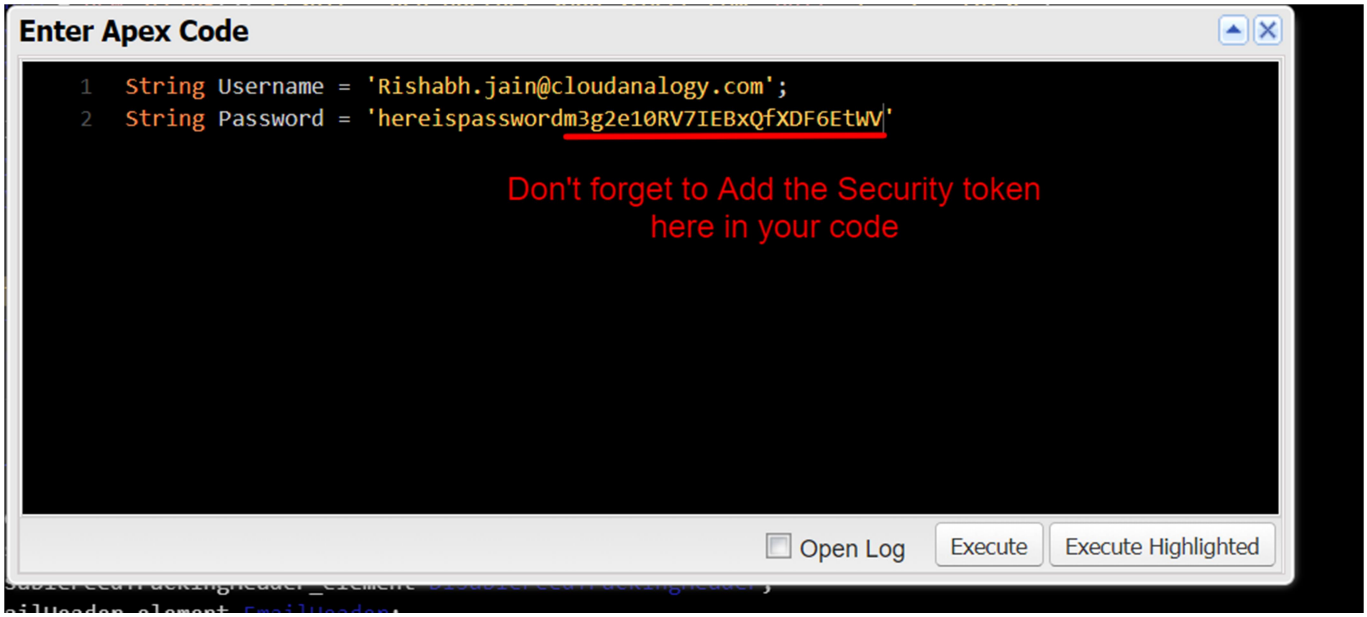
support@jp.salesforce.com <support@jp.salesforce.com>
to me

We've sent you a new Salesforce security token because you recently changed your password or requested to reset your security token. Use
desktop clients that require it.

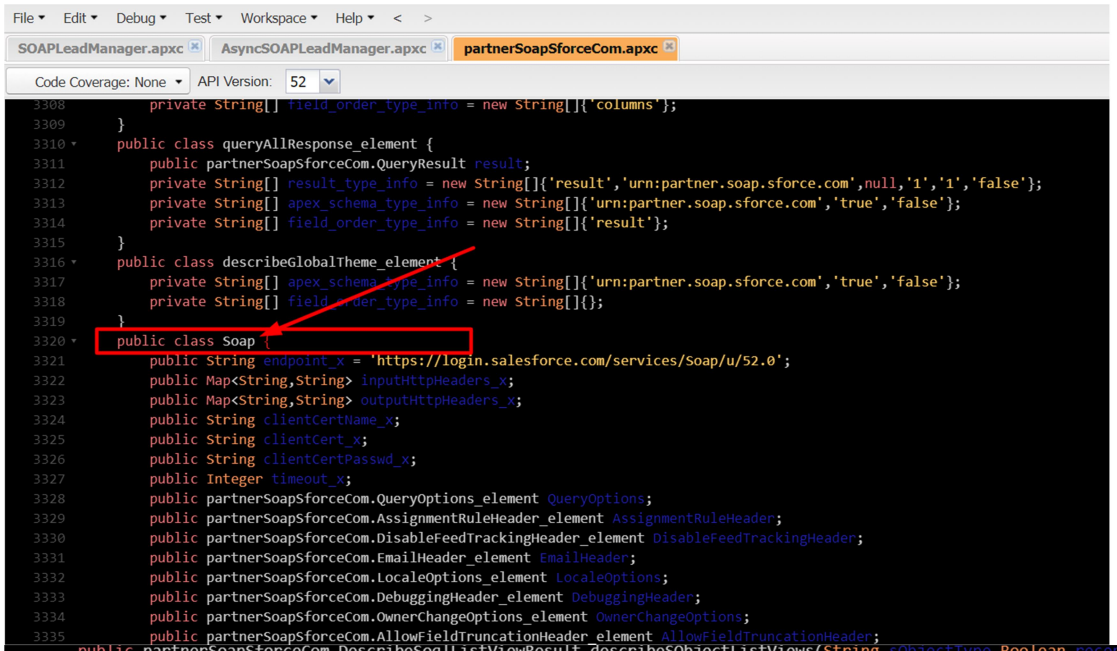
Username: rishabh.jain@cloudanalogy.com
Security token (case-sensitive): m3g2e10RV7IEBxQfXDF6EtWV

For more information on using your security token, see Reset Your Security Token at https://help.salesforce.com/HTViewHelpDoc?id=user_se

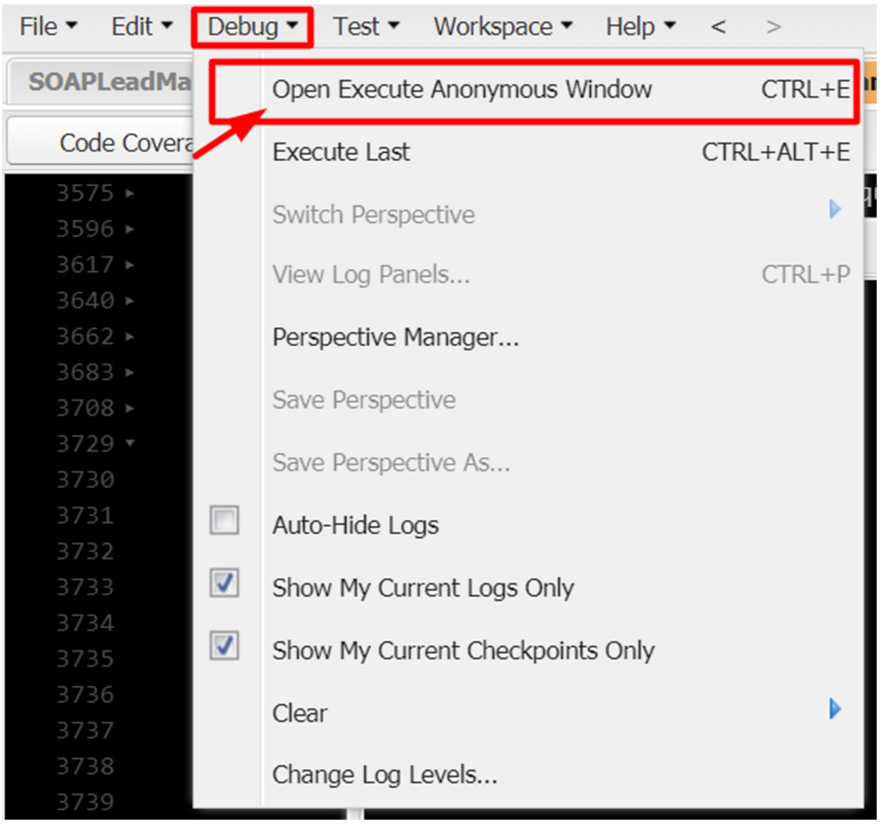
- Copy the above security token and paste it with the password in the anonymous window.



- Find the Login method inside the Soap inner class and utilize that method to get the session Id from the server.

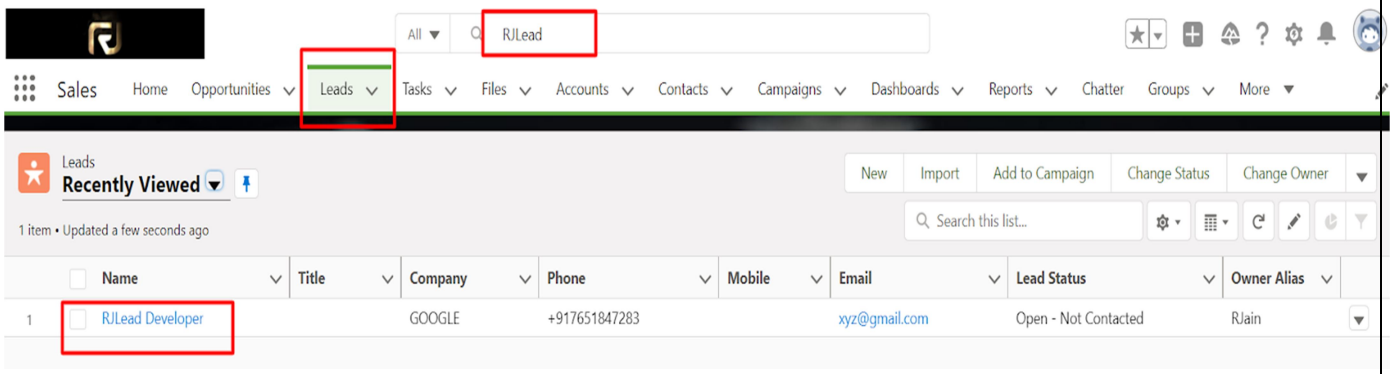


- Open an anonymous window to execute the login method and get the session Id.



- Processing Response.

- Execute the above script.
- Go back to the server and search for the lead you created.


All
RJLead
Sales
Home
Opportunities
Leads
Tasks
Files
Accounts
Contacts
Campaigns
Dashboards
Reports
Chatter
Groups
More
Leads
Recently Viewed
1 item • Updated a few seconds ago
New
Import
Add to Campaign
Change Status
Change Owner
Search this list...
Name
Title
Company
Phone
Mobile
Email
Lead Status
Owner Alias
1
RJLead Developer
GOOGLE
+917651847283
xyz@gmail.com
Open - Not Contacted
RJain